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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,167	02/13/2004	Hideyuki Nishikawa	019519-418	4460

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EXAMINER

HON, SOW FUN

ART UNIT PAPER NUMBER

1772

DATE MAILED: 06/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/777,167

Applicant(s)

NISHIKAWA ET AL.

Examiner

Sow-Fun Hon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133): Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 6-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

#### ***Withdrawn Rejections***

1. The 35 U.S.C. 112, 2<sup>nd</sup> paragraph rejection of claims 5-6 is withdrawn due to Applicant's cancellation of claim 5, and amendment of independent claim 1.
2. The obviousness-type double patenting rejection of claims 1-2, 7, 10-11 over claims 1-2 of US 6,685,998 in view of US 6,839,110, and that of claims 1-2, 6-11 over US 6,540,940 in view of US 6,839,110 are withdrawn due to Applicant's amendment of independent claim 1, and the new grounds of rejection set forth below.
3. The 35 U.S.C. 102(e) and 103(a) rejections of claims 1-3, 6-11 over Yamahara as the primary reference are withdrawn due to Applicant's amendment of independent claim 1, and the new grounds of rejection set forth below.

#### ***New Rejections***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Claim Objections***

5. Claim 6 is objected to because of the following informalities: It depends on cancelled claim 4 instead of independent claim 1 as intended. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

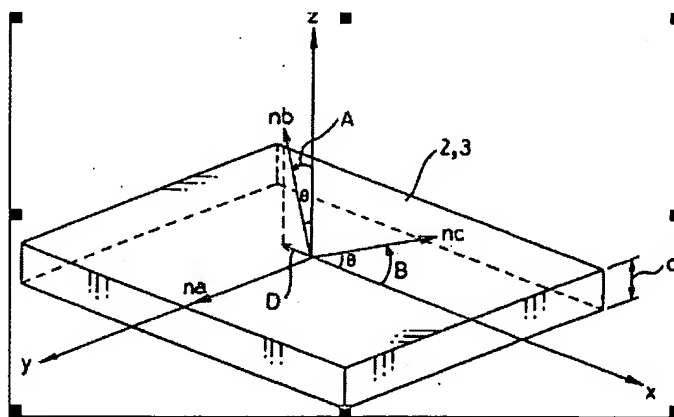
6. Claims 1-2, 7, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamahara (US 6,839,110).

Regarding claim 1, Yamahara teaches a retardation film (phase difference film, also known as a phase difference plate, column 9, lines 35-36) comprising a transparent support (column 8, lines 20-26) positioned in a plane (See Fig. 1, wherein 2 and 3 are the phase difference films or plates, column 8, lines 20-25). Yamahara teaches at least one optically anisotropic layer which exhibits biaxiality (column 8, line 58), having a first direction a with a smallest refractive index  $n_a$  ( $n_a < n_b < n_c$ , column 8, lines 55-60), and a second direction with a largest refractive index  $n_c$  ( $n_a < n_b < n_c$ , column 8, lines 55-60), wherein the first direction a is orthogonal to a direction z normal to the xy plane of the transparent support (direction of principal refractive index  $n_a$  coincides with the direction of the y-coordinate axis, the x, y and z-coordinate axes that are orthogonal to each other, column 8, lines 40-45, Fig. 3 of Yamahara shown on the next page), and wherein the optically anisotropic layer is formed of at least one compound exhibiting a liquid crystal phase (liquid crystal polymer with positive index anisotropy, column 8, lines 23-26). Yamahara fails to teach that the angle between the second direction and the direction z normal to the xy plane of the transparent support is 80 to 100°.

However, in one embodiment, Yamahara teaches that the second direction c is inclined by inclination angle  $\theta$  of about 20° with respect to the x-coordinate axis (the direction of the principal refractive index  $n_b$  inclined by about 20° in the direction of arrow a with respect to the z-coordinate axis, while the direction of the principal

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refractive index  $n_c$  inclined by about  $20^\circ$  in the direction of arrow B with respect to the x-coordinate axis, column 11, lines 40-45, Fig. 3 of Yamahara shown below), within the xz plane, which means that the angle between the second direction c and the direction z normal to the xy plane of the transparent support is  $70^\circ$  the angle between the second direction c and the direction z normal to the xy plane of the transparent support is  $70^\circ$ ; and in another embodiment, Yamahara teaches that the second direction c is inclined by inclination angle  $\theta$  of about  $0^\circ$  with respect to the x-coordinate axis (the direction of the principal refractive index  $n_b$  coincides with the z-coordinate axis, while the direction of the principal refractive index  $n_c$  coincides with the direction of the x-coordinate axis, column 17, lines 5-15), within the xz plane, which means that the angle between the second direction c and the direction z normal to the xy plane of the transparent support is  $90^\circ$ . The range of  $70$  to  $90^\circ$  taught by Yamahara for the angle between the second direction c and the direction z normal to the xy plane of the transparent support, overlaps the claimed range of  $80$  to  $100^\circ$ .



Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided an angle between the second direction c and the direction z normal to the xy plane of the transparent support, within the range of 80 to 100°, in order to provide the desired optical effect, as taught by Yamahara.

Regarding claim 2, Yamahara teaches that the liquid crystal phase is a biaxial liquid crystal phase (positive refractive index anisotropy, column 8, lines 23-25).

Regarding claim 7, Yamahara teaches that the compound exhibiting the biaxial liquid crystal phase is a polymer compound (liquid crystal polymer with a positive refractive index anisotropy provided on the support, column 8, lines 21-26).

Regarding claim 10, Yamahara teaches that the liquid crystal polymer is treated with an oblique orientation technique or hybrid orientation (column 8, lines 25-28), which means that the at least one optically anisotropic layer, formed from the at least one compound exhibiting a liquid crystal phase, is not stretched.

Regarding claim 11, Yamahara teaches that the retardation film, which is elliptically optically-anisotropic (phase difference plate 2 has a refractive index ellipsoid, column 8, 28-30), abuts a polarizing film (overlapping plate 4, column 8, lines 19-30, Figure 1), to constitute an elliptically polarizing film.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamahara, as applied to claims 1-2, 7, 10-11 above.

Yamahara teaches a retardation film comprising: a transparent support positioned in a plane; and at least one optically anisotropic layer having a first direction with a smallest refractive index, and a second direction with a largest refractive index,

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wherein said at least one optically anisotropic layer is formed of at least one compound exhibiting a liquid crystal phase; said at least one optically anisotropic layer exhibits biaxiality; and the first direction is orthogonal to a direction normal to the plane of the transparent support, wherein it would have been obvious to one of ordinary skill in the art to have provided an angle between the second direction and the direction normal to the plane of the transparent support within the range of 80 to 100°, as discussed above. Yamahara fails to teach that the retardation film further comprises an alignment film between the transparent support and said at least one optically anisotropic layer.

However, Yamahara teaches that an alignment layer (11,14) is used to align the liquid crystal in the liquid crystal cell (16, column 8, lines 11-15), and that the liquid crystal in the anisotropic layer is treated with an orientation technique (column 8, lines 25-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used an alignment layer between the transparent support and said at least one optically anisotropic layer of the retardation film of Yamahara, to align the liquid crystal in the anisotropic layer of the retardation film, as well as the liquid crystal in the liquid crystal cell of Yamahara, in order to obtain the desired orientation provided by the alignment layer.

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8. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamahara as applied to claims 1-2, 6-7, 10-11 above, and further in view of Negoro (US 6,540,940).

Yamahara has been discussed above, and fails to teach that the alignment layer comprises a polymer having at least one of a hydrophobic group and an excluded volume group, let alone that it comprises a repeating unit represented by Applicant's formula (I) and a repeating unit represented by Applicant's formula (II) or (III).

However, Negoro teaches a retardation film (an optical compensatory sheet) comprising: a transparent support (substrate), an alignment film (orientation) layer and an optically anisotropic layer compound exhibiting a liquid crystal phase (liquid crystal, column 91, lines 22-31), and that the alignment film comprises an acrylic copolymer or methacrylic copolymer comprising a repeating unit represented by formula (I) of Applicant and a repeating unit represented by formula (II) or (III) of Applicant, which is a species of the polymer having at least one of a hydrophobic group and an excluded volume group, as defined by Applicant (original claim 8 is generic to original claim 9).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the alignment film of Negoro as the alignment film of Yamahara, in order to take advantage of its properties, as taught by Negoro.



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9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamahara, as applied to claims 1-2, 6-7, 10-11 above, and further in view of Ono (US 6,712,896).

Yamahara teaches a retardation film comprising: a transparent support positioned in a plane; and at least one optically anisotropic layer having a first direction with a smallest refractive index, and a second direction with a largest refractive index, wherein said at least one optically anisotropic layer is formed of at least one compound exhibiting a liquid crystal phase; said at least one optically anisotropic layer exhibits biaxiality; and the first direction is orthogonal to a direction normal to the plane of the transparent support, wherein it would have been obvious to one of ordinary skill in the art to have provided an angle between the second direction and the direction normal to the plane of the transparent support within the range of 80 to 100°, as discussed above. Yamahara fails teach that the biaxial liquid crystal phase is a biaxial nematic liquid crystal phase.

However, Ono teaches a retardation film (optical compensation film, column 26, line 50) which has an optically anisotropic layer on a support, wherein the optically anisotropic layer comprises a compound which more preferably exhibits a biaxial nematic liquid crystal phase (column 26, lines 55-58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a compound which exhibits a biaxial nematic liquid crystal phase in the optically anisotropic layer of the retardation film of Yamahara, in order to provide the desired retardation properties, as taught by Ono.

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10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamahara as applied to claims 1-2, 6-7, 10-11 above, and further in view of Cannon KK (Derwent abstract of JP 50103485A).

Yamahara has been discussed above, and fails to teach that the alignment film comprises a polymer having at least one of a hydrophobic group and an excluded-volume group.

However, Cannon KK teaches an alignment film (coated with mol. orientation promoting agent, abstract) comprising a polymer having at least one of a hydrophobic group and an excluded-volume group (alkali metal salt of the poly(acrylic acid) partial ester, abstract) as defined by Applicant's specification (original claims 8-9), wherein the ester is the hydrophobic group, and the alkali metal salt group is the excluded-volume group. Cannon KK teaches that the polymer (mol. orientation promoting agent) aligns nematic liquid crystals vertically with no degradation of the liquid crystal properties and hence improves service lifetime for the device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the polymer of Cannon KK, having at least one of a hydrophobic group and an excluded-volume group, as defined by Applicant, in the alignment film in the retardation film which is obvious over Yamahara, in order to align liquid crystals with nematic phase vertically with no degradation of the liquid crystal properties and hence improve the service lifetime for the retardation film of Yamahara, as taught by Cannon KK.

***Response to Arguments***

11. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*S. Hon*  
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06/16/06

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